Climate Change and Need for Adaptation

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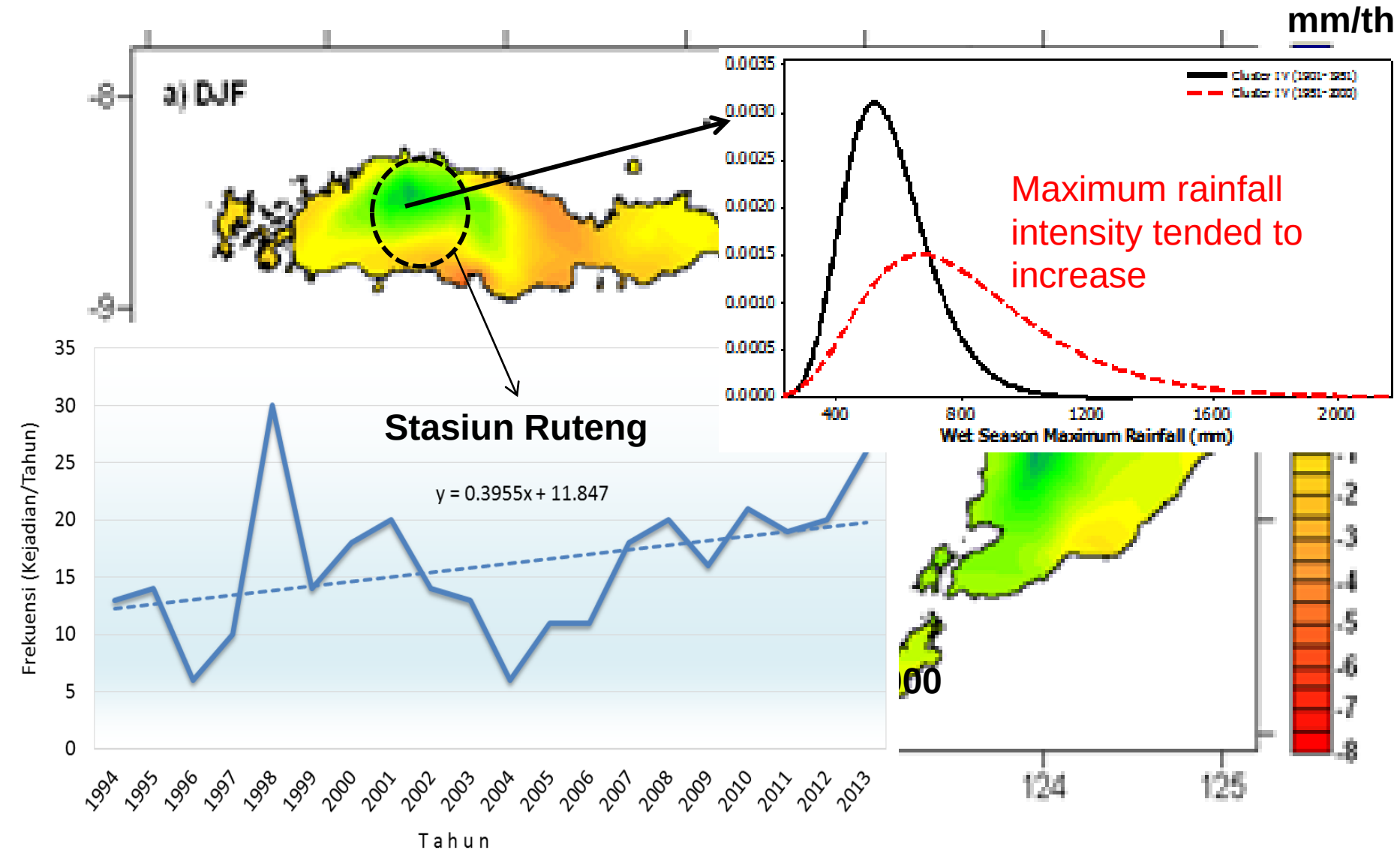
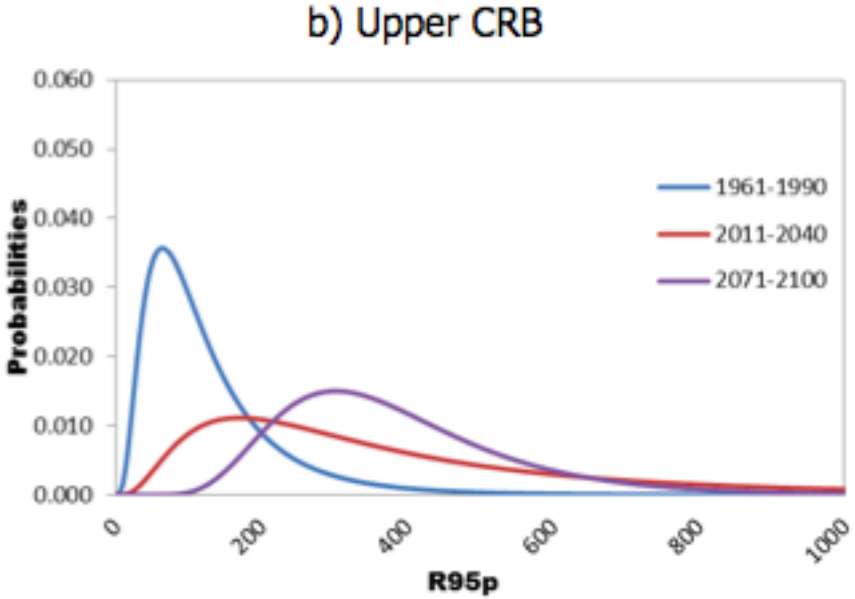
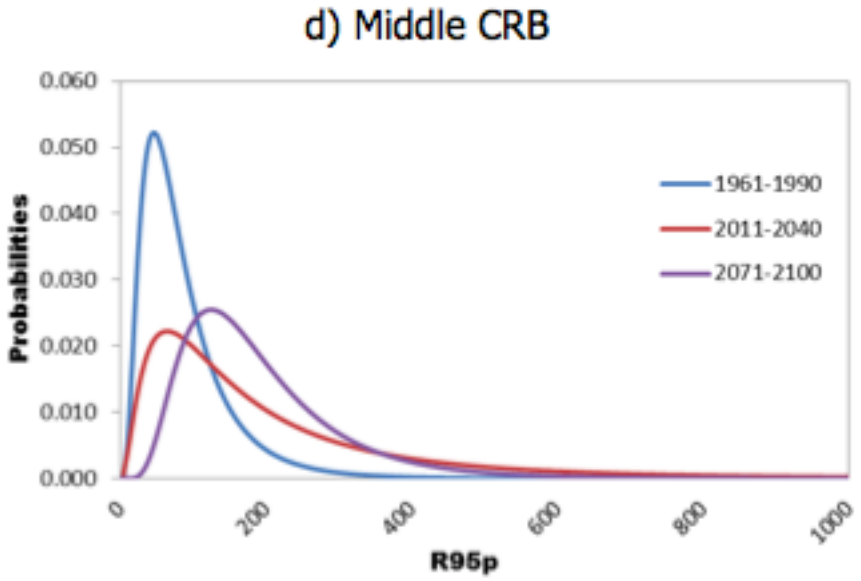
Introduction

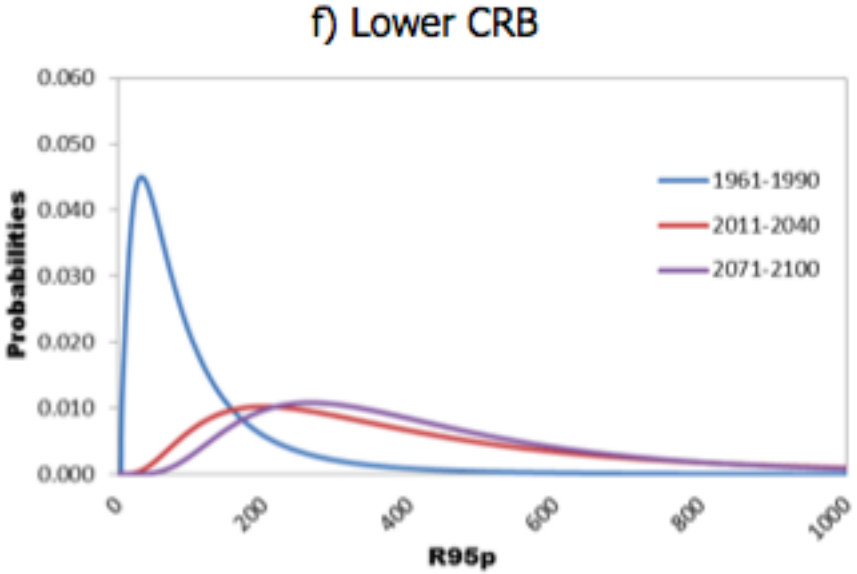
- Global warming due to the increase of GHG concentration in the atmosphere has caused the change of intensity and frequency of extreme climate events
- Based on historical climate observation in Indonesia, Indonesian climate has changed. In some area the onset have shifted and extreme climate events is becoming more intense and more frequent

Frequency and intensity of extreme climate event tended to increase (1994-2013): Manggarai





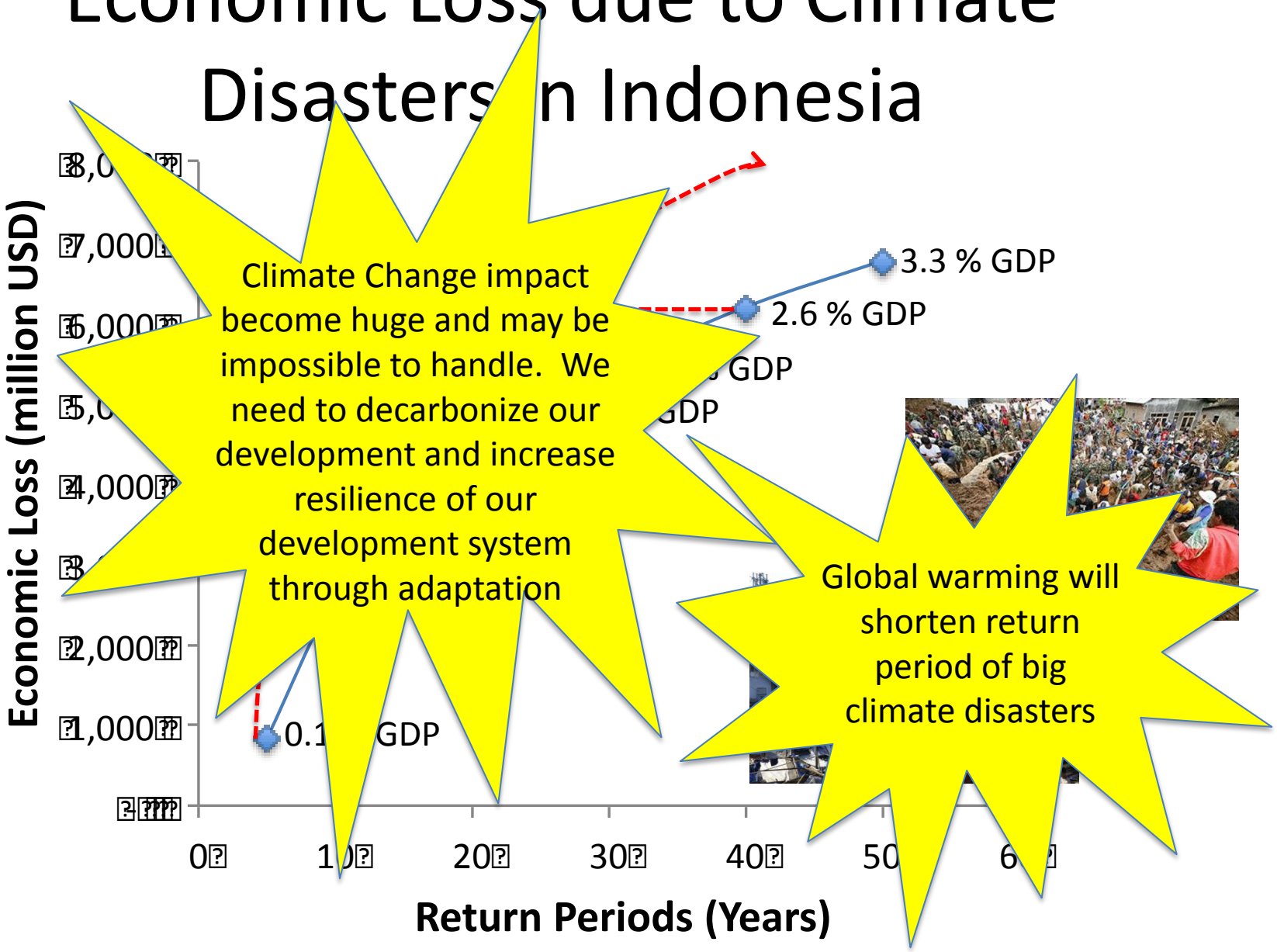




Intensity of extreme climate events tend to increase in the future (e.g. on CRB maximum Rainfall tends to increase in the future

Sumber: Faqih et al., 2014

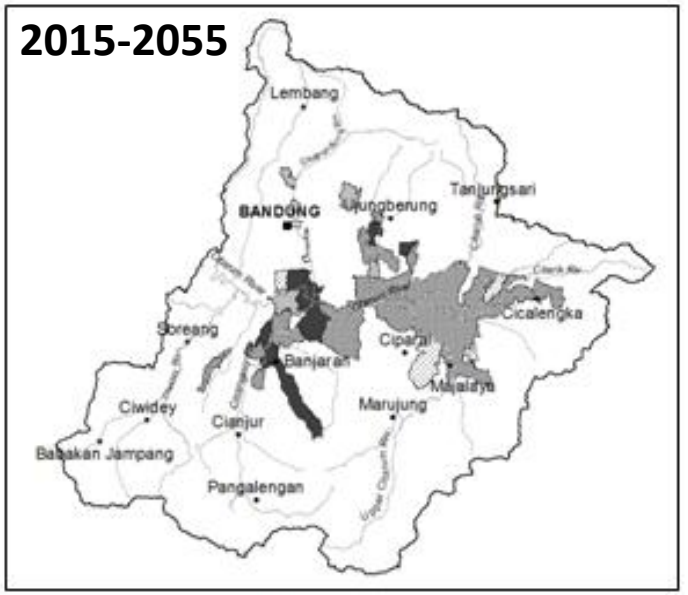
Economic Loss due to Climate Disasters in Indonesia

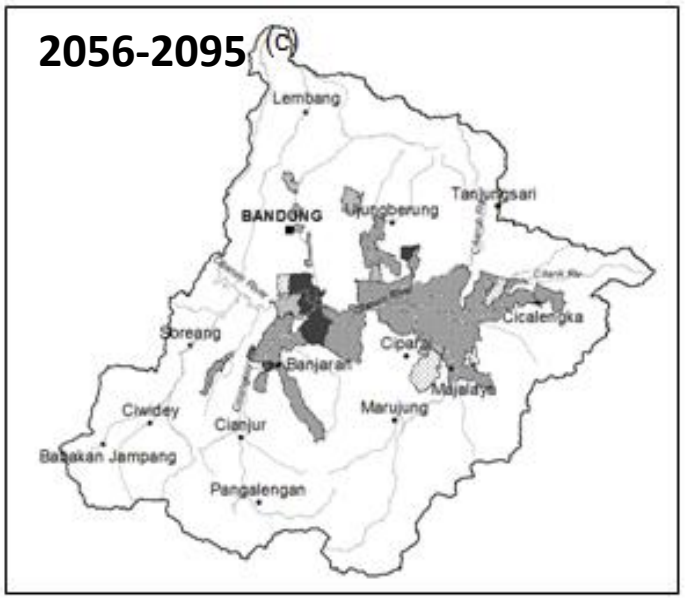


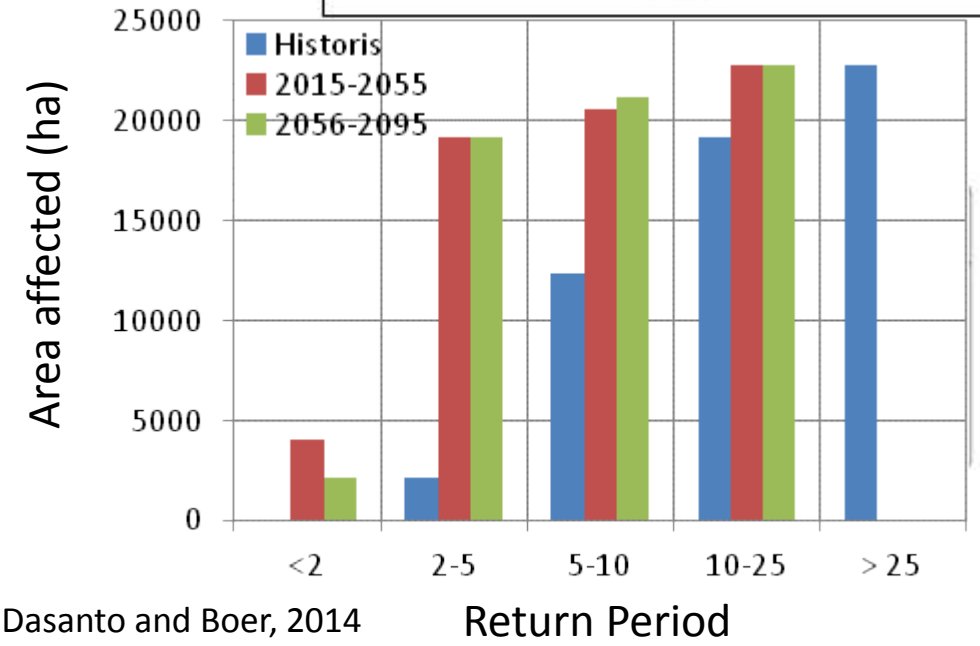
Source: Analyzed based on Gupta (2010)

Climate Change will shorten return period of big flood in 'Cekungan Bandung'

Return period of big flood will shorten from 25 year to 10-25 years. Big flood affect area of about 22,725 ha covering 79 desa



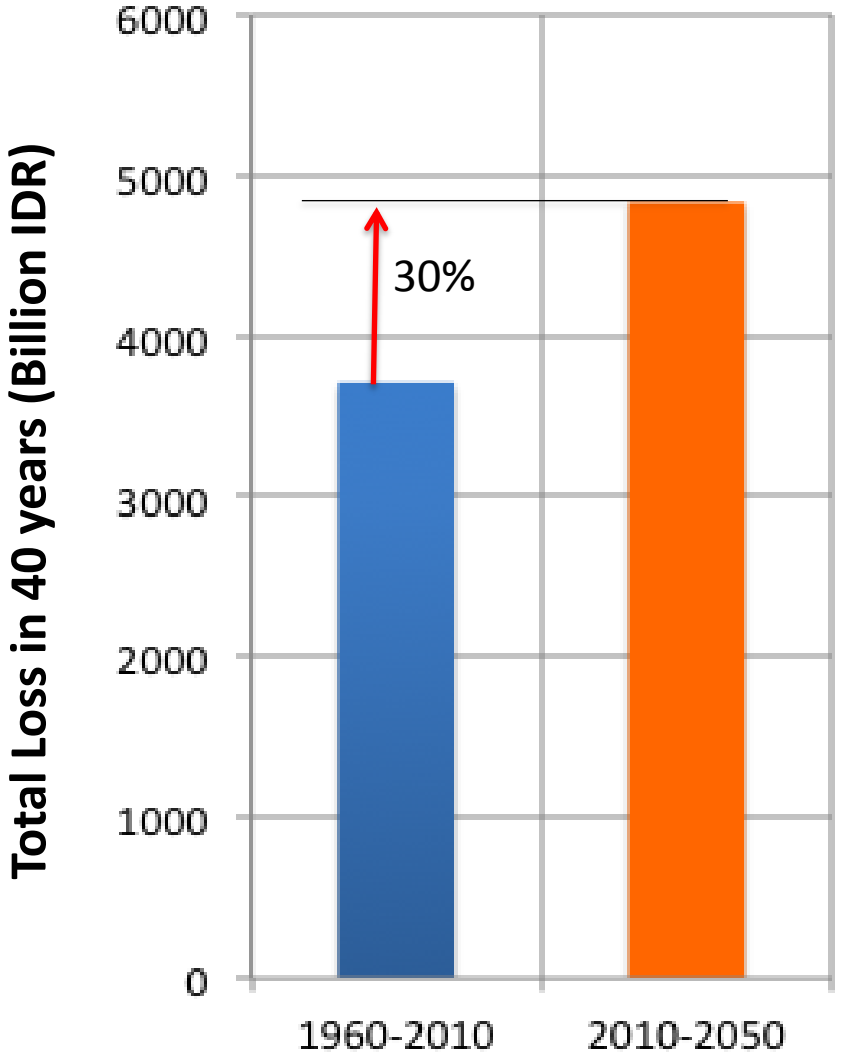




Source: Dasanto and Boer, 2014

Economic Loss due to Flood disasters with return period 40 years (without discount factor): Bandung Case - Indonesia

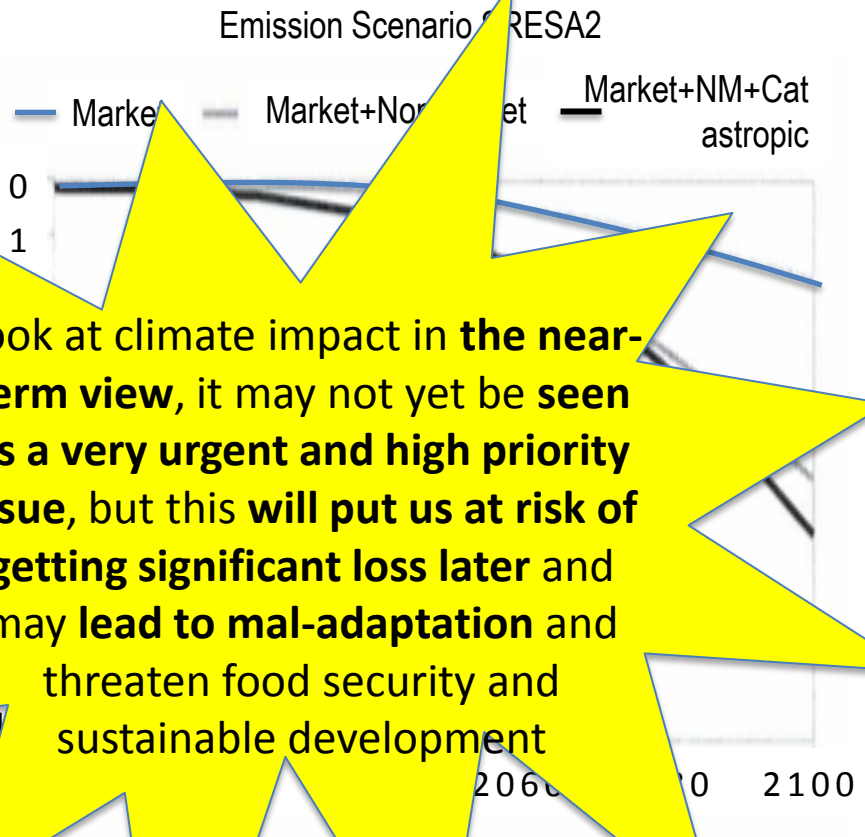
- At present, flood disasters with return period of 40 years will cause economic loss of about 3680 billion IDR (eq. to annual loss of about 8 million).
- In the future the level of loss will increase by 30%



Source: Boer *et al.*, 2014

Economic Implication of Climate Change in Indonesia (no mitigation and adaptation efforts)

- Two types of impact are considered:
  - Market impact (on the agriculture sector and coastal zones), and
  - Non-market impact (on hea nd ecosystems)
  - Risk of catastrophic (only ice melting, excluding flash flood and others extreme events)
- Mean loss of 1.8% of gross do product (GDP) by 2100 on an ani basis, if market impact only, it is wel above the world's 0.6%
- With non-market impact, the loss increased to 6% and with inclu catastrophic it increased to 7%, well above the world 2.2 and 2.6% respectively
- Early investment for adaptation about 0.2% of GDP could avoid damage amounting to 1.9% of the GDP by 20100 on annual basis

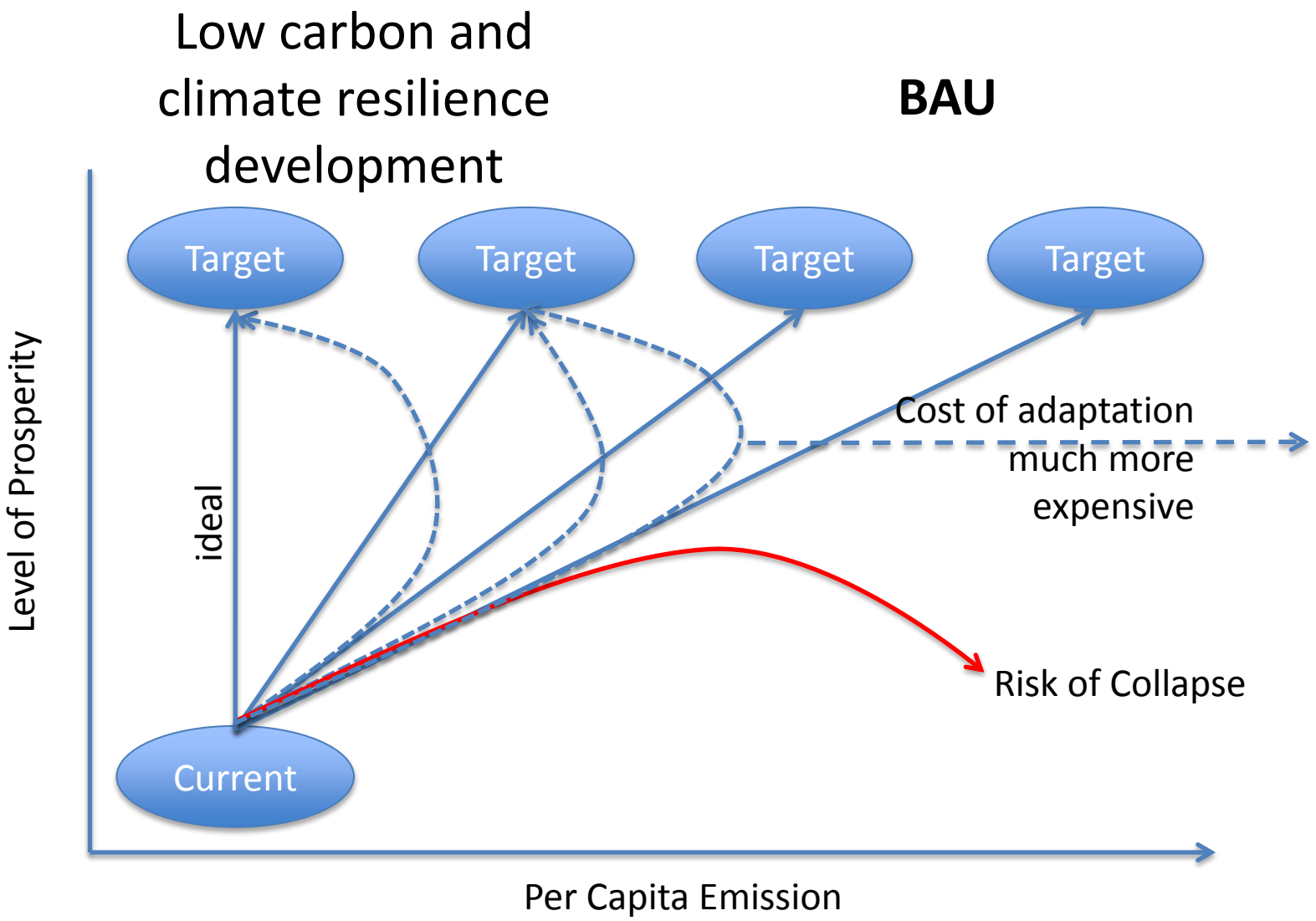


Look at climate impact in **the near-term view**, it may not yet be **seen as a very urgent and high priority issue**, but this **will put us at risk of getting significant loss later** and may **lead to mal-adaptation** and threaten food security and sustainable development

Using F E model

(So ce: Suplach lasai et al. 2009)

The Need to Integrate Mitigation and Adaptation Actions



Research Needs

- Many research on adaptation have been done, but ones related to cost and benefits of adaptation is very limited.
- Planning for coping with current climate and anticipated climate change impact requires decisions based on sound economic consideration. This information can help policy maker to decide
  - What specific adaptation investments is required (e.g. combination of hard and soft structural intervention → ecosystem-based-adaptation approach, as well as non-structural intervention → integration of adaptation and mitigation)?
  - How to prioritize them?
  - What level of investment and funding is required?
- Designing tools for policy making process and investment decision
  - Many of adaptation program were developed NOT based on quantitative assessment of climate risk

Capacity Needs